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FLEHR HOHBACH TEST
ALBITTON & HERBERT LLP
SUITE 3400 FOUR EMBARCADERO CENTER
SAN FRANCISCO, CA 94111

EXAMINER	
ZERVIGON, RUDY	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/470,446	INGLE ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5,6,9-12 and 17-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,6,9-12 and 17-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 17-21, and 24-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami Soichiro (JP61-37969), or, in the alternative, under 103(a) as being obvious over Kawakami Soichiro (JP61-37969). Soichiro teaches a gas delivery metering tube (item 23, Figure 3 - Figures 1,2), comprising: an inner tube (item 3, Fig.1,2) having an open end (bottom), a capped end (top) opposite the open end (bottom), and a first array (15, Figure 1,2) of orifices distributed along a substantial length of the inner tube (item 3, Fig.1,2) between the open end (bottom) and the capped end (top), the inner tube (item 3, Fig.1,2) being configured to allow introduction of a gas into its entire inner volume from the open end (bottom) and to provide an outflow of the gas through the first array (15, Figure 1,2) of orifices; and an outer tube (2, Figure 1,2) nested and axially aligned with the inner tube (item 3, Fig.1,2) so that an annular space (19, Figure 1,2) is formed between the inner and outer tubes to receive the outflow of the gas from the inner tube (item 3, Fig.1,2), the outer tube (2, Figure 1,2) including a second array (14, Figure 1,2) of orifices distributed along a substantial length of the outer tube (2, Figure 1,2), the

second annular space (19, Figure 1,2) being sized and the second array (14, Figure 1,2) of orifices being sized and numbered to achieve substantially uniform gas pressure in the annular space (19, Figure 1,2) and an outflow of the gas through the second array (14, Figure 1,2) of orifices that is substantially uniform along the substantial length of the outer tube (2, Figure 1,2) for a range of operating conditions, as claimed by claim 17.

Soichiro's drawings may suggest:

i. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein the first array (15, Figure 1,2) of orifices being sized and numbered to establish a substantially uniform backing pressure within the entire inner volume of the inner tube (item 3, Fig.1,2) despite the introduction of the gas from the open end (bottom) and the outflow of the gas along the substantial length of the inner tube (item 3, Fig.1,2), as claimed by claim 18

ii. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein a cross sectional area of the annular space (19, Figure 1,2) is within a factor of three of a inner cross sectional area of the inner tube (item 3, Fig.1,2), and wherein a total cross sectional area of the second array (14, Figure 1,2) of orifices in the outer tube (2, Figure 1,2) is equal to or less than one tenth of a surface area of the outer tube (2, Figure 1,2) to promote pressure uniformity within the annular space (19, Figure 1,2) and uniform outflow of the gas along the substantial length of the. outer tube (2, Figure 1,2), as claimed by claim 19

iii. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 19 wherein the cross sectional area of the annular space (19, Figure 1,2) and the cross sectional area of the inner tube (item 3, Fig.1,2) are approximately equivalent, as claimed by claim 20

iv. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 19 wherein the total cross sectional area of the plurality of orifices in the outer tube (2, Figure 1,2) is equal to or less than one hundredth of the surface area of the outer tube (2, Figure 1,2), as claimed by claim 21

v. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein the substantial length of the inner tube (item 3, Fig.1,2) is about 68 times a diameter of the inner tube (item 3, Fig.1,2), as claimed by claim 24

vi. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein an inner diameter of the inner tube (item 3, Fig.1,2) is about 0.114 inch and an outer diameter of the inner tube (item 3, Fig.1,2) is about 0.134 inch, as claimed by claim 25

vii. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein an inner diameter of the inner tube (item 3, Fig.1,2) is about 0.136 inch and an outer diameter of the inner tube (item 3, Fig.1,2) is about 0.156 inch, as claimed by claim 26

viii. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein the sizes of the plurality of orifices in the inner tube (item 3, Fig.1,2) are smaller than the sizes of the plurality of orifices in the outer tube (2, Figure 1,2), as claimed by claim 27

ix. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 27 wherein a diameter of each of the plurality of orifices in the inner tube (item 3, Fig.1,2) is about 0.0095 inch to about 0.014 inch, and a diameter of each of the plurality of orifices in the outer tube (2, Figure 1,2) is about 0.0138 inch to about 0.0153 inch, as claimed by claim 28

Soichiro's drawings are not shown to scale. Further, Soichiro does not give any dimensional information for Soichiro's apparatus parts. As a result, the Examiner cannot asertain if Soichiro's apparatus anticipates or makes obvious Applicant's dimensional requirements. It is noted

however, proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. (See Hockerson-Halberstadt, Inc. v. Avia Group Int'l, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000), MPEP 2125)

In the event that Soichiro is not deemed to anticipate Applicant's claimed dimensions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the dimensions of Soichiro's apparatus.

Motivation optimize the dimensions of Soichiro's apparatus is to delivery process gases "..supplied stably and uniformly into the anode from a port 13 of the peripheral wall of the cathode 1." ("Constitution") and "To supply stably a reaction gas and to form a uniform thin film by providing plural chambers..." ("Abstract"). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (the configuration of the claimed disposable plastic nursing container was.MPEP 2144.04).

4. Claims 1, 3, 5, 6, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami Soichiro (JP61-37969)[1] in view of Otsuki; Hayashi et al. (US 5474641 A). Kawakami Soichiro describes:

i. A gas delivery metering tube (item 23, Figure 3 - Figures 1,2) for delivering a gas (Purpose, first line), comprising:

ii. An innermost elongated tube (item 3, Fig.1,2), said innermost tube (item 3, Fig.1,2) having two ends, a gas delivery end (lower end) that is attached (via horizontal plate supporting 3, and 1,2) to a gas supply (5, Figure 1, page 6, last paragraph of translation), and an opposite, capped end (upper end) – Figure 1 shows the innermost tube (3) as "capped" at the extreme end (upper end) opposing the gas supply, as claimed by claim 1

iii. one or more arrays of orifices (items 13, 14, 15; Fig. 1,2) formed in each of the at least innermost (item 3, Fig.1,2) and outermost (items 2,1, Fig.1,2) nested tubes and extending along a substantial length (Figures 1,2) of each of the tubes, as claimed by claim 1

iv. an outermost elongated tube (items 2,1, Fig.1,2), the outermost tube having one or more arrays (13, 14; Fig.1,2) of orifices extending along a substantial length of the outermost tube, the outermost tube being disposed such that it is nested and axially aligned with the innermost tube (Fig. 1,2), and such that an effective annular space (item 18 or 19, Figures 1,2; "buffers", Constitution) is formed between the innermost (3) and the outermost (2 or 1) nested tubes, as claimed by claim 1

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v. wherein the one or more arrays of orifices formed in said innermost tube establishes a substantially uniform ("stably and uniformly", Constitution) backing pressure along substantially the length of the innermost (item 3, Fig.1,2) tube, thereby promoting substantially uniform ("stably and uniformly", Constitution) delivery of the gas (Purpose, first line) out of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost (items 2,1, Fig.1,2) tube and along substantially the length of the outermost (items 2,1, Fig.1,2) tube, as claimed by claim 1 - When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

vi. wherein gas flowing into the innermost tube (item 3, Fig.1,2) from the gas supply is introduced into the interior of the innermost tube (item 3, Fig.1,2) at the gas delivery end, as claimed by claim 1

vii. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the metering tube (item 23, Figure 3 - Figures 1,2) is used in a chemical vapor deposition system, as claimed by claim 6

viii. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the nested tubes are cylindrical, as claimed by claim 9

ix. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 and at least one injector assembly (item 4, Figure 1, item 6a, Fig.4) having at least one port (item 8, Figure 1, item 3a, Fig.4) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2), as claimed by claim 11

x. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 and at least one shield (item 21, Figure 3) assembly having at least one plenum (inside portion of item 21, Figure 3) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2), as claimed by claim 12

Kawakami Soichiro does not teach the relative dimensions of Kawakami Soichiro's innermost elongated tube (item 3, Fig.1,2) and Kawakami Soichiro's outermost tube (items 2,1, Fig.1,2). As such, Kawakami Soichiro does not teach Applicant's claim 1 limitations of wherein the innermost tube (item 3, Fig.1,2) has the following properties:

$L/D < 70$

$D/d \approx< 10$

$Na_{port}/A_{tube} \approx< 1$

Where L is the length and D is the diameter of the innermost tube (item 3, Fig.1,2), d is the diameter of one orifice in said array of orifices (items 13, 14, 15; Fig. 1,2), and A_{tube} is the cross sectional area of the interior of said innermost tube (item 3, Fig.1,2); and the outermost tube (items 2,1, Fig.1,2) has the following properties:

D_{eff} and D_{in} are within a factor of three of each other

$SurfaceArea_{outer} / NA_{outer} \approx 10$ or more

wherein D_{eff} is an effective diameter of the effective annular space (items 18-20, Figures 1,2; "buffers", Constitution), $SurfaceArea_{outer}$ is the surface area of the outermost tube (items 2,1, Fig.1,2), NA_{outer} is the total cross sectional area of all of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost tube (items 2,1, Fig.1,2), and D_{in} is the inner diameter of the innermost tube (item 3, Fig.1,2) such that delivery of the gas out of the orifices (items 13, 14, 15; Fig. 1,2) in the

outermost tube (items 2,1, Fig.1,2) is substancially uniform along the substancial length of the outermost tube (items 2,1, Fig.1,2) over a range of operating conditions, as claimed by claim 1.

Kawakami Soichiro further does not teach:

i. $D_{eff} \approx D_{in}$, as claimed by claim 3

ii. $SurfaceArea_{outer} / NA_{outer} \approx 100$ as claimed by claim 5

iii. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the nested tubes are rectangular, as claimed by claim 10

Matsumoto teaches a gas injection pipes (68, 69; Figure 11; column 17, line 53 – column 18, line 21) including first array (49, Figure 11) of orifices and the second array (48, Figure 11) of orifices for creating a uniform flow velocity as taught by Matsumoto (column 18; lines 8-15)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary either the dimensions (L,D) of the gas delivery metering tube or vary the distribution (Na_{port}) and/or the dimension ($d, A_{port/tube}$) of the orifice and/or tube dimensions, further to shape Kawakami Soichiro's tubes in rectangular form.

Motivation vary either the dimensions (L,D) of the gas delivery metering tube or vary the distribution (Na_{port}) and/or the dimension ($d, A_{port/tube}$) of the orifice and/or tube dimensions, further to shape Kawakami Soichiro's tubes in rectangular form is to delivery process gases "..supplied stably and uniformly into the anode from a port 13 of the peripheral wall of the cathode 1." ("Constitution") and "To supply stably a reaction gas and to form a uniform thin film by providing plural chambers..." ("Abstract") as taught by Kawakami and for creating a uniform flow velocity as taught by Matsumoto (column 18; lines 8-15). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC

Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (the configuration of the claimed disposable plastic nursing container was.MPEP 2144.04).

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami Soichiro (JP61-37969) in view of Matsumoto; Akinori et al. (US 5956859 A). Kawakami is discussed above. Kawakami does not teach:

i. The gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein the first array (15, Figure 1,2) of orifices and the second array (14, Figure 1,2) of orifices are rotationally offset by about 180 degrees from each other, as claimed by claim 22

Matsumoto teaches a gas injection pipes (68, 69; Figure 11; column 17, line 53 – column 18, line 21) including first array (49, Figure 11) of orifices and the second array (48, Figure 11) of orifices are rotationally offset by about 180 degrees from each other, as claimed by claim 22.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to rotationally offset, by about 180 degrees, Kawakami's first array (15, Figure 1,2) relative to Kawakami's second array (14, Figure 1,2) as taught by Matsumoto.

Motivation to rotationally offset, by about 180 degrees, Kawakami's first array (15, Figure 1,2) relative to Kawakami's second array (14, Figure 1,2) as taught by Matsumoto is for creating a uniform flow velocity as taught by Matsumoto (column 18; lines 8-15).

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami Soichiro (JP61-37969) in view of Otsuki; Hayashi et al. (US 5474641 A). Kawakami is discussed above. Kawakami does not teach the gas delivery metering tube (item 23, Figure 3 - Figures 1,2) of Claim 17 wherein the inner tube (item 3, Fig.1,2) and the outer tube (2, Figure 1,2) are made of a material that tolerates cleaning etchants including hydrofluoric acid, as claimed by claim 23.

Otsuki teaches Teflon as an HF compliant material (column 5; lines 54-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use teflon as HF compliant material in Kawakami's apparatus as taught by Otsuki.

Motivation to use teflon as HF compliant material in Kawakami's apparatus as taught by Otsuki is for using HF as a process carrier gas as taught by Otsuki (column 5; lines 39-41).

Response to Arguments

7. Applicant's arguments with respect to claims 1, 3, 5, 6, 9-12, and 17-28 have been considered but are moot in view of the new grounds of rejections.

Conclusion

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: USPat. 6729041

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

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